

Goat Farming Business in Communal Enclosure Through Female Farmer Empowerment

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The integration of agriculture and livestock plays an important role in food security through the utilization of plant waste for animal feed and the processing of livestock manure into fertilizer. The livestock sector has great potential for development, supported by the continuously increasing demand for animal protein consumption. Women play a role in livestock management, but their competence is still low due to limited access to capital, training, and supporting infrastructure. This research aims to analyze in-depth the process of women's empowerment in livestock management through communal enclosure and its impact. The research method is qualitative with a case study approach. Data were collected through in-depth interviews, observations, and documentation. The research results show that livestock management with empowerment has economic and social impacts for women. The presence of communal system innovations in shared barn management, a goat kid redemption system, and a livestock manure exchange system in the form of water to address drought issues. The role of change agents, family support, and strong social capital are key factors in the success of empowerment. The strategy involves engaging supporting stakeholders to strengthen their roles by increasing motivation and participation. This study recommends the creation of specific policies to support the empowerment of women in sustainable farming practices.

Keywords: CSR, communal enclosure, goat farming, female farmer group, empowerment, social capital, stakeholders.

INTRODUCTION

Food security has become a highly regarded global issue, as reflected in the second sustainable development goal, which focuses on improving nutrition, food security, and promoting sustainable agriculture to reduce poverty levels (United Nations, 2015). Data shows that in 2022, more than 2.8 billion or more than one-third of the global population could not afford nutritious food, while one in eleven individuals worldwide, or approximately 713 to 757 million people, experienced hunger in 2023 (FAO, IFAD, UNICEF, WFP, WHO, 2024). The situation has become a serious issue that needs to be addressed. Efforts to address the challenges of global food security require sustainable and innovative approaches to meet food needs and nutrition through integrated farming systems that enhance the economy, social welfare, and environmental sustainability (Abbasi *et al.*, 2024). Studies indicate that integrated farming systems can enhance farmers' profitability by integrating ruminant livestock, poultry, fish, and vegetables, which provide food

security as well as increased household income (Akter *et al.*, 2024). Even during the Covid-19 pandemic, diversification practices in integrated farming systems have shown positive impacts on income stabilization and food availability (Wang *et al.*, 2024). Based on this, it indicates that integrated farming systems have the potential to be developed, one of which is through the integration of agriculture with livestock. Livestock breeding contributes to food resilience (Battheu-Noirfalise *et al.*, 2024) through processing manure into organic fertilizer to suffice the plant nutrition (Kleinpeter *et al.*, 2023). This indicates that the potency livestock sector integrated into farming can improve food supply, accessibility, use, and stability (Datta *et al.*, 2024; Sarma, 2024). The integration of farming system and livestock breeding into the utilization of plant wastes as livestock feed (Sekaran *et al.*, 2021) and the processing of livestock manure and urine into fertilizer to improve soil fertility (Han *et al.*, 2023) shows its contribution to improved productivity and sustainable environment (Sekaran *et al.*, 2021). This manure management is a form of sustainable farming strategy encouraging the

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farmers to adopt environment-friendly practice (Sadehpour and Afshar, 2024) and to reduce greenhouse gas emission indicating an attempt of mitigating climate change (Delandmeter *et al.*, 2024). The use of manure as fertilizer as a circular economic model (Valverde-Orozco *et al.*, 2024) by reducing production cost can minimize the pollution of chemical fertilizer (Han *et al.*, 2023) and create a resilient sustainable food system (Sadehpour and Afshar, 2024).

Livestock breeding belongs to a sector potential to develop due to the consumers' high demand for animal protein (Andriamparany *et al.*, 2023). Livestock breeding sector plays an important role in supplying high protein source (Pardo *et al.*, 2022) in addition to supporting the sustainable means of earning living or rural people in local, cultural, and social-economic system (Aldosari, 2018). Therefore, considering the great potency of livestock breeding sector, intervention is needed to improve its contribution to food resilience, household income, productivity and women's role within it (Sarma, 2024).

Women play important role in agricultural economic development (Akpa *et al.*, 2024), however the problem arising is that they are inhibited with the limited access to funding, land, and other productive resources (Edafe *et al.*, 2023). Being busy with domestic chores also limits their time in agricultural industry and thereby leads to the low women participation (Abdu *et al.*, 2022) and affects the income gained (Edafe *et al.*, 2023). Social-cultural factor and women's weak influence on decision making also inhibit women participation (Valerio *et al.*, 2024). Women in Rembang Regency, Central Java Province, Indonesia have limited economic access and low participation in decision making (only 66.98%), as shown in the data of Gender Empowerment Index in 2023 (Badan Pusat Statistik Kabupaten Rembang [Rembang Regency's Central Bureau of Statistics], 2024). Such condition shows the presence of gap needing a comprehensive policy reforming strategy in supporting gender equality (Valerio *et al.*, 2024) through an attempt of improving women's access to land, capital, and education (Akpa *et al.*, 2024). This action is called empowerment, carried out through integrating a variety of approach strategies including education, finance, and intrinsic change to improve food and health accessibilities, and to facilitate education for women (McCarthy and Krause, 2024). A successful empowerment needs collaboration between all stakeholders (Maldonado-Castro *et al.*, 2024) including government, community institution, and corporation. Corporations are now starting to engage in gender equality issues by improving policy and women empowerment practice through CSR program as the form of corporate responsibility to community and environment (Sweileh, 2024). PT. PLN Nusantara Power UP Rembang as one of corporations operating in supplying public electricity needs in Rembang Regency initiated women empowerment through optimizing the people's potency. This is as mentioned in

Sustainable Development Goals giving emphasis on women empowerment to end discrimination and to achieve women's right equality (United Nations, 2018).

Village has abundant natural resources with farming and livestock breeding potencies, in which majority of its people have livestock as productive asset or saving and insurance (Collishaw *et al.*, 2023). Livestock raising activity needs women's role and thereby allows them to access and control livestock and their products (Montcho *et al.*, 2023). This is because essentially women play equal role in the community leading to social and economic changes (Maldonado-Castro *et al.*, 2024). The attempt of involving women in livestock breeding has encouraged the initiative of women empowerment (Montcho *et al.*, 2023) to achieve economic independence and to be catalyst in achieving gender equality (Sangwan and Kumar, 2021). Empowerment strategy is implemented through group approach to confirm social capital value by encouraging collective action between women and thereby improving their organizational skill (Cheek and Corbett, 2024).

Female farmer group is a forum where women assemble to exploit their ability of contributing to sustainable development. This can be achieved with participative governance, ecotourism approach, and environment-friendly farming practice (Sgroi, 2022) through integrating farming and livestock breeding (Audouin *et al.*, 2024). Women empowerment in the development of livestock breeding sector needs greater attempt to develop a more efficient system (dos Santos Souza *et al.*, 2019) such as introducing technology allowing for the monitoring of animal production, genetic superiority, and physiological condition (Pardo *et al.*, 2022). Land functions as foundation of farming, source of wealth, and source of income for the farmers (Qu *et al.*, 2023), but limited land can inhibit livestock breeding business. Therefore, innovation is needed to support the development of livestock breeding business in one site through applying communal enclosure. Communal or colony livestock breeding is to put several livestock in one enclosure area with the process of raising, weaning, and fattening carried out in the enclosure (Ningtias *et al.*, 2023). Livestock management through communal enclosure can facilitate transfer of technology because communication occurs directly in the group enclosure location rather than seeing the livestock raisers one by one so that the process of transferring knowledge becomes more effective (Andriyanto and Aisah, 2020).

The introduction of innovation in livestock development should be followed with the improvement of human (women) resource capacity to manage it. This is supported with rural women's activities starting to develop toward livestock raising in addition to plant cultivation (Islam *et al.*, 2022). The problem arising is that women still have limited knowledge and ability in livestock management leading to the decreased productivity (Nirmala *et al.*, 2012). Therefore, training can



encourage the improvement of women's skill and wellbeing supported with the combination of asset transfer that can influence livestock productivity and income gained (Argent *et al.*, 2014).

The presence of training encourages women to have new insight and skill and thereby will grow their self-confidence in decision making and financial management. This affects the rural development positively so that women should be encouraged and supported to participate in managing livestock breeding business from upstream to downstream. Various stakeholders will engage in this empowerment process with their respective roles and interests within it. The mapping of stakeholders is important to do in the empowerment process to improve the success of empowerment (Surachman *et al.*, 2022).

Several recent studies highlight the positive impact of integrating sustainable agricultural systems in improving farmers' welfare (Aker *et al.*, 2024), creating job opportunities (Bhat *et al.*, 2023), enhancing food security (Abbasi *et al.*, 2024), maximizing food production (Puech and Stark, 2023), reducing land degradation, and increasing crop diversity (Chuanrum and Shrestha, 2024). These studies overall focus more on how the implementation of integrated farming system practices and their impacts on the economy, environment, and society. The issue of women has not been reviewed in several of these studies, particularly focusing on the empowerment of women to support their roles in achieving the successful implementation of integrated farming systems. In relation to livestock management, several studies review the use of technological systems such as aerobic composting technology (Zhao *et al.*, 2024), the utilization of Geographic Information Systems (GIS) (Grieco *et al.*, 2024) in animal waste management, the application of virtual fencing technology in livestock grazing management (Schillings *et al.*, 2024), biosensor technology in livestock health monitoring (Neethirajan *et al.*, 2017) and the use of the Air Management Practices Assessment Tool (AMPAT) technology in reducing emissions, gases, and particulates in farming activities (Maurer *et al.*, 2016). These studies provide an overview of technological innovations and their benefits in livestock management. The application of innovation in livestock management is not only about the utilization of technology but also the use of a group livestock management system through communal enclosure, which has not been discussed in previous studies. The innovation of communal enclosure can enhance the efficiency of resource use, market access, and strengthen cooperation among farmers. These social values serve as capital in livestock development, which is also an important aspect alongside the use of technological innovations.

Based on previous research, this study focuses more on the implementation of communal enclosure through the empowerment of women. This research is structured to answer several research questions, including: a) What is the

impact of implementing a communal enclosure system on women's empowerment? b) What are the factors that influence the success of women's empowerment in livestock farming? c) What are the strategies to strengthen the role of stakeholders for the sustainability of women's empowerment in livestock farming? Therefore, this research specifically aims to analyze in-depth the process of women's empowerment in farm management through communal enclosure and its social, economic, and environmental impacts.

MATERIALS AND METHODS

This research used a qualitative method to reveal a phenomenon occurring within the community. The qualitative research aims to produce knowledge in-depth and interpretatively concerning the relation between human beings and environment viewed from the perspectives of experience, and situation or condition occurring (Bercht, 2021). The approach used in this research was case study to describe in-depth the phenomenon of women engagement in livestock breeding sector. A case study approach gives a comprehensive understanding on intervention process (Su *et al.*, 2024); in this research the context lies on the analysis of women group. The research location was selected by the author based on some considerations adjusted with the objective of research. This research was carried out in Sendangasri Village, Lasem Sub District, Rembang Regency, Central Java Province. The map of research area location is shown in Fig. 1.

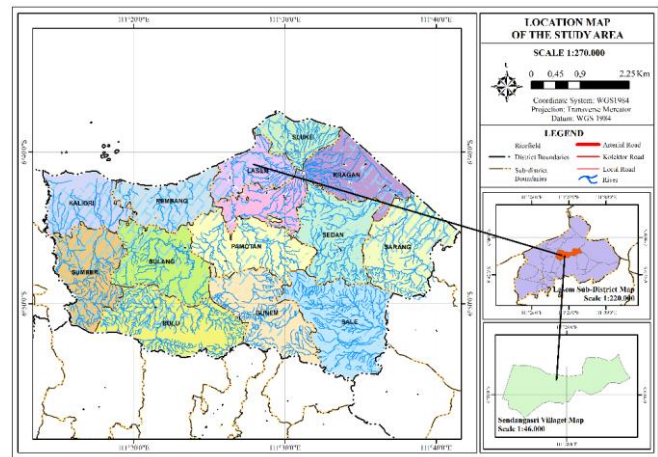


Figure 1. Research location

Sendangasri Village has regional characteristics, the majority people of which work in farming sector, supported with natural condition appropriate to farming development. Majority of its people work as farmers and livestock raisers all at once. One of the livestock types bred by the people is goat. This is because of still high demand for animal protein



consumption in the market. Goat belongs to ruminants just like cow and sheep. The number of livestock populations in Rembang Regency in 2020-2023 indicates that among other ruminants, goat is the one with highest population in the 3-year period (Dinas Pertanian dan Pangan Kabupaten Rembang [Rembang Regency's Office of Farming and Food Affairs], 2024), as illustrated in Figure 2.

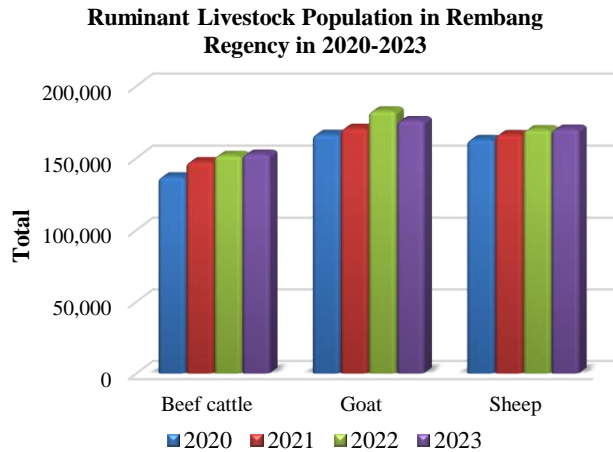


Figure 2. Chart of ruminant livestock population in Rembang Regency in 2020-2023

Source: Farming and Food Statistics (2024)

Fig. 2 shows that the number of goat population in Rembang Regency reaches 176,016 in 2023. In detail, based on the data of livestock population per sub district area, goat still dominates the livestock population bred by the community in Lasem Sub District. The data of ruminant livestock population in Lasem Sub District in 2022-2023 (BPS Kabupaten Rembang [Rembang Regency's Central Bureau of Statistics], 2024) is shown in Figure 3.

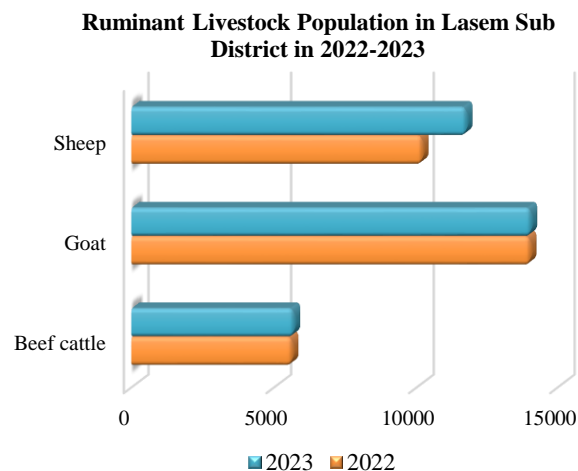


Figure 3. Chart of ruminant livestock population in Lasem Sub District in 2022-23.

Source: Rembang Regency's Office of Agricultural Affairs (2024)

Based on Figure 3, it shows that goats still dominate the livestock kept by the community in Lasem District, with a population of 14,022 in 2023. Based on the data in Figures 2 and 3, it indicates the high interest of the community in Rembang Regency in goat farming. This is in line with Dubeuf *et al.* (2023) study finding that the number of goats globally has increased significantly since 1960s until today. Goats have survivability and adaptability to climate stress. Therefore, considering the potencies existing, this research will analyze the goat breeding management by engaging women's role within it.

Data is collected through in-depth interviews, observations, and documentation. In-depth interviews are part of the data collection design that can be conducted directly or via phone or video call (BinDhim *et al.*, 2024). Interviews were conducted by asking questions to several informants who were purposively selected. The purposive sampling technique was carried out by selecting several informants based on considerations relevant to the research objectives. In this case, informants were chosen from individuals who have information and knowledge about the implementation of women's empowerment in the application of communal enclosure. The informants in this study include female farmers, the head of the female farmers' group, agricultural extension workers, CDO (Community Development Officer) facilitators, village stakeholders, and the Agricultural Office. Observation was conducted by monitoring the process of livestock management through the communal enclosure system, which includes the participation of women, the forms of assistance provided by agricultural extension workers and CSR facilitators, as well as the involvement of other stakeholders. Documentation was carried out by photographing the activities conducted and collecting documents relevant to the research to strengthen the data obtained from interviews and observations. Source and method triangulation are used in this research to enhance the validity and credibility of the research data. Source triangulation is conducted by collecting and comparing data sources from interviews with one informant to another, while method triangulation involves comparing data from interviews, observations, and documentation for analysis and conclusion drawing. The Table 1 shows the list of informants in this study.

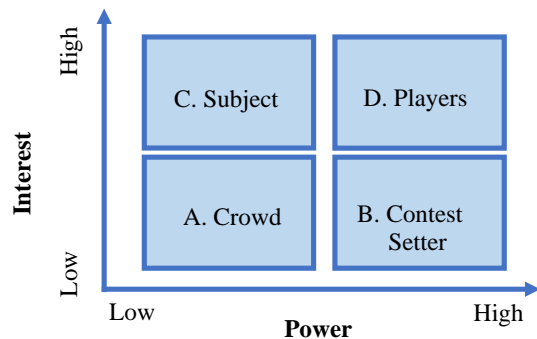
Data gathered were then analyzed using an interactive model by using an interactive model through gathering, reducing, displaying data, and drawing conclusion (Miles and Huberman, 1992). Data on livestock management through women engagement by means of empowerment initiative were analyzed descriptively, while data on the role of stakeholders were analyzed using stakeholder mapping. This method used power and interest analysis to identify stakeholders to determine what intervention and action need to take (Tresiana and Duadji, 2021).



Table 1. List of research informants

Infor mant	Status	Position	Technique of collecting data	No. of informant
A	Key informant	Head of female farmer group	In-depth interview, participatory observation, documentation	1
B	Key informant	A member of female farmer group	In-depth interview, participatory observation, documentation	15
C	Key informant	Agricultural extensionist	In-depth interview, observation, documentation	3
D	Key informant	Facilitator of CSR/CDO	In-depth interview, observation, documentation	2
E	Supporting informant	Village Official	Interview	2
F	Supporting informant	Office of Agricultural Affairs	Interview	1

Power was analyzed from how much capacity the stakeholder has in influencing goat breeding business management communally through women empowerment. Interest was analyzed from the actions fundamentally motivating the stakeholders to manage goat breeding business. [Lee et al. \(2024\)](#) study explained that the left side of matrix is filled in with individuals having limited ability of influencing policy while the right side shows individuals who can create the direction of policy. The stakeholders in this research are mapped further in the matrix below.

**Figure 4. Matrix of Stakeholder Mapping**

Source : [Bryson \(2004\)](#) in [Eason et al. \(2011\)](#)

RESULTS AND DISCUSSION

Women farmers in Sendangasri Village face various challenges in developing themselves, such as limited infrastructure, market access, education, and insufficient skills in applying information technology. These conditions result in limited economic opportunities and underrepresentation of their productivity [Adebayo and Worth \(2024\)](#)

in their research mention that women face discrimination in accessing land, agricultural extension services, and resources; women are often considered economically inactive even though they contribute to every process of agricultural activities. The presence of an active women's farming group, a high interest in agriculture manifested in active participation, and social interactions that foster a sense of family and cooperation serve as both capital and potential for the women farmers in Sendangasri Village to advance their capacity towards a better condition than before. The Melati Women's Farmers Group has been established since 2010 and is still active to this day. This women's farmer group serves as a platform to develop women's skills in utilizing local potential, thereby increasing the income of women and their families. Studies show that collective actions taken together in groups encourage the formation of cooperation, increase women's participation in decision-making, provide access to skill enhancement through training and counselling, and boost women's confidence to present their ideas representing the group in national and international forums ([Bano et al., 2023](#)). The existence of this potential encourages community facilitators to jointly advance society, especially female farmers, through empowerment initiatives with collaboration among all stakeholders.

Female farmer empowerment in Sendangasri village was carried out through CSR program with group approach. Empowerment was implemented by giving the women access to resource, authority of decision making, and opportunity of achieving social and economic objective and thereby encouraging the women to take part in productive activities ([Maldonado-Castro et al., 2024](#)). Problem identification, and potency and target need mapping are carried out in the process of building women's capacity through empowerment. Female farmers were directed to develop integrated farming and livestock breeding collectively through Melati Female Farmer Group (*Kelompok Wanita Tani Melati*). The process of implementing livestock management through communal enclosure with the empowerment of women is explained as follows:

Livestock management system: Livestock management was implemented in communal enclosure with a total of 15 female goats and 8 male goats. Communal enclosure is designed with the partition between goats. Each of rooms partitioned is filled in with 1 (one) adult goats or 2 (two) baby goats with the name of each member of female farmer group. This management is a means of giving the women a responsibility for taking care of their own livestock. Women participation in livestock management includes the followings:

1. Women engage in the process of mating male and female goats in communal enclosure.
2. Women engage in helping the goats' birth.
3. Women engage in livestock breeding by feeding and cleaning the pen every morning and evening.
4. Women engage in processing goat's manure and urine



wastes into fertilizer.

5. Women engage in the process of marketing goat breeding's product.

There is an interesting system in goat breeding business management in Melati Female Farmer Group after the members' goats give birth to baby goats. When the members' goats raised in communal enclosure have given birth to baby goat, the members should deposit an amount of money to the group's cash. This system is created based on the members' mutual agreement with the provision of nominal amount determined based on the type and number of baby goats. The members having deposited an amount of money to the group are given discretion to bring their goat home or to sell them. The nominal amount of money the members should deposit based on the provision of type and baby goat number is explained in the table below.

Table 2. Baby goat depositing system

Number of types of baby goats	Amount of money deposit
1 male baby goat	IDR 150,000
1 female baby goat	IDR 100,000
2 male baby goat	IDR 250,000
2 female baby goat	IDR 150,000

Source: Result of in-depth interview (2024)

In special case, if the members' goat gives birth to 3 (three) baby goats, only 2 are counted as being deposited to the group. This management results from the initiative of women affiliated with Melati Female Farmer Group and agreed mutually. This management system is intended to maintain the existence of groups and the sustainability of group activities through cash fund source compiled together from goat breeding management.

This management system has been implemented since a long time ago and still survives until today indicating the presence of strong trust, kinship, and togetherness values. These value are social capital serving as a capital of bonding between individuals established interpersonally based on shared identities and encouraging collective action (Ziorklui *et al.*, 2024). The presence of social capital in the group can strengthen emotional support between individuals to get new knowledge and creative ideas facilitating the access to limited resources (Kim *et al.*, 2022). Therefore, in building social capital between individuals, the key element needed is a reciprocal norm (Putnam, 1995) improving the creation of shared values.

Environment sustainability is also an important point in livestock management in Melati Female Farmer Group. Women, in addition to engaging in livestock breeding and enclosure maintenance, also process manure into fertilizer. Majority people in Sendangasri Village have goat breeding business but this animal's manure has not been processed yet and left to pile. Such conditions can result in environmental problems, so that a program called *Mbah Dalang*

(*Pengelolaan Limbah Kandang Komunal untuk Lingkungan*) [Communal Enclosure Waste Management for Environment). This program is implemented by engaging women in gathering manure in one site to be composted and thereby to produce solid and liquid fertilizers. The whole activity of processing manure from gathering, milling, to composting is carried out by women. This fertilizer resulting from the processing carried out by female farmers in Sendangasri is used in their own land and group land to give nutrition to the plant. The marketing of fertilizer is also carried out directly through online order.

Female farmers' knowledge and skill of processing manure are acquired from the presence of training and demonstration delivered by agricultural extensionists along with CSR facilitator of PT. PLN Nusantara Power UP Rembang. Agricultural extensionist helps significantly farming community's growth and development by guiding and motivating them to acquire new skills (Amin *et al.*, 2023). Several trainings have been provided, including trainings on goat breeding business management, on manure fertilizer production, on liquid organic fertilizer production and on institutional administrative bookkeeping. Human resource management in goat breeding business management is carried out through training and this also creates a group climate giving every individual discretion to exchange idea. This is the manifestation of organizational justice affecting individual's performance significantly and positively (Sutirino *et al.*, 2024).

The livestock management integrated into environmental issues is not only manifested into the processing of manure waste into fertilizers but also encourages the development of *Mbah Dakir* (*Pengelolaan Limbah Kandang untuk Kehidupan Air*) (Enclosure Waste Management for Water Life) program. This program departed from drought conditions occurring in Sendangasri Village during dry season. This management system is implemented through exchanging manure waste with water from Melati Female Farmer Group. The exchange is adjusted with weight and dryness level of manure, in which the drier the manure, the higher the purchasing value will be. One (1) kg of manure costs IDR 100-150 is exchanged for water in a 20-liter sized container of water costing IDR 3,000. Every exchange is recorded in the form of water saving. The programs in this women empowerment belongs to social innovation that should be developed into a more comprehensive socio-ecological innovation to lead the people (community) to sustainable change (Junuda *et al.*, 2024). The livestock management system in the female farmer groups in Sendangasri Village is summarized in the Figure 5.

The impact of implementing the communal enclosure system on women's empowerment: The implementation of the communal enclosure system in livestock management not only has a positive impact on the environment by processing livestock manure into fertilizer but also contributes to the



enhancement of women's capabilities. Livestock management through the innovation of communal enclosure with an empowerment approach has brought many changes for women. The abilities of women farmers have improved both in group management and livestock farming, from breeding, care, to livestock waste processing. Even the process of goat birthing is done by women themselves. Training in the use of information technology is also provided to female farmers to improve marketing access while encouraging women to actively access information in developing their livestock businesses. This shows that with empowerment, not only are the supporting infrastructure facilities improved, but also the skills, confidence, and self-assertiveness of women are encouraged. Along with the improvement in women's skills in managing goat livestock through communal enclosure, economic opportunities for women also increased. This finding is in line with the research by [Goli et al. \(2024\)](#) that providing access to resources for women can increase income, encourage participation in decision-making, and social and economic activities.

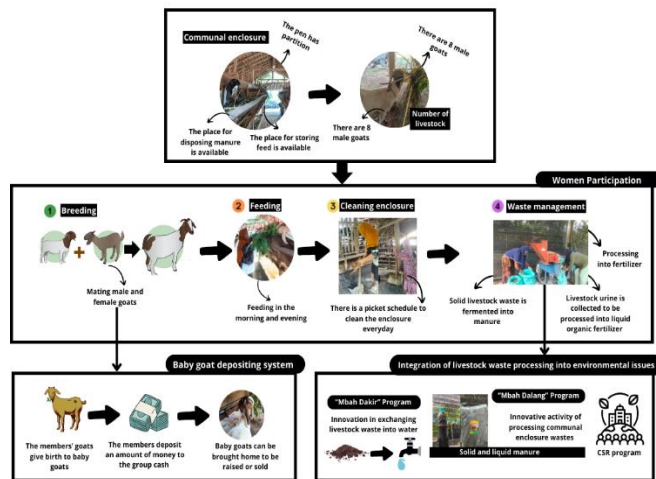


Figure 5. Goat breeding management system in female farmer group in Sendangasri Village.

Source: Result of in-depth interview, observation and documentation (2024)

The ownership of goats by women can be used as a living savings asset to finance children's school needs or other necessities. The system of goat kid deposits implemented within the group and mutually agreed upon, with the funds used as a group fund, is not only beneficial for financing group activities but also for providing loans to members in need of emergency funds through a savings and loan service. During regular group meetings, the chairperson offers to members who need a loan, with the money lending system allowing a maximum loan of IDR. 1,000,000 for one member each month. The use of manure processed by the women's farming group has reduced agricultural production costs, and

the sale of the manure has increased household income. Additionally, women have also processed the results of plant cultivation into food products with market value. Some of these factors indicate that through the integration of agriculture and livestock, not only is food security improved, but it also provides economic opportunities for women to help meet their family's living needs.

Livestock management through communal enclosure encourages the formation of social values among female farmers. Empowerment brings positive benefits in enhancing the values of solidarity and togetherness among individuals. This is demonstrated by a high social spirit and enthusiasm for mutual cooperation in livestock farming activities, such as during shifts to clean the pens, feed the animals, and process livestock manure waste. This cooperation can be seen in the activity of processing livestock manure waste into fertilizer, with each farmer's wife helping each other as shown in Fig. 6.



Figure 6. Cooperation of women farmers in processing fertilizer from livestock waste.



The positive impact generated from the implementation of communal enclosure through the empowerment of women is not separate from several key factors that influence it. Change agents play a role in the success of women's empowerment. The chairperson of the women's farmer group plays an important role in the development of the group. The group leader, as an agent of change, encourages, motivates, drives, and unites its members to carry out every activity in livestock management. Agricultural extension officers also play a role in providing extension services that influence the success of empowerment, as recommended by the research of [Lecoutere et al. \(2023\)](#) to design extension services with a gender-transformative approach that can significantly increase women's involvement in agriculture. Support from the family also plays an important role in the success of women's empowerment. This support is given to provide women with the freedom to develop their potential while also giving them the opportunity to be involved in efforts to build the village. A strong sense of family and cooperation among individuals can drive the achievement of goals. Therefore, empowerment not only enhances existing resources but also strengthens social values among individuals, which are essential elements for the sustainability of the program. Collaboration with stakeholders is also key to the success of empowering female farmers, such as the role of CDO CSR and agricultural extension workers as facilitators who provide support in capacity building and connect with other stakeholders.

The role of stakeholders: Stakeholders are those either directly or indirectly helping decide what should be achieved in a program and what strategy to be used to achieve it ([Tresiana and Duadji, 2021](#)). Stakeholders play an important role in a successful empowerment process in livestock breeding business management. Each stakeholder has interest and power necessarily mapped to arrange strategy to support empowerment program. Several stakeholders engaged are, among others: head and members of female farmers group, agricultural extensionist, CSR facilitator, village officials and Office of Agricultural Affairs. Power and interest of individual stakeholders in goat breeding business management belonging to Female Farmer Group in Sendangasri Village are mapped in the table below.

Table 3. shows that stakeholders play different roles. The classification of stakeholders consists of the main stakeholder and supporting stakeholder. The main stakeholder consists of those with great influence on the implementation of female farmer empowerment in livestock breeding business management. The main stakeholders include head and members of female farmer group, agricultural extensionist, and facilitator of CSR/CDO. Supporting stakeholder consists of those with not-too-big influence and serving only to help the implementation of women empowerment program in livestock breeding business management. Supporting stakeholders consists of village officials and the office of agricultural affairs. Stakeholder analysis is then mapped in the form of matrix, as shown below.

Table 3. Matrix of stakeholders' interest and power in goat farming business.

No.	Stakeholder	Interest		Power	
		Degree	Configuration	Degree	Configuration
1.	Head of female farmer group	High	<ul style="list-style-type: none"> - Leading and organizing the members - Motivating the members - Preparing plan and evaluating the members' performance 	High	Affecting the improvement of members' performance and group's progress
2.	Agricultural Extensionists	High	<ul style="list-style-type: none"> - Holding facilitation and training - Connecting group to other stakeholders - Building cooperation and networking 	High	Affecting the group development through policies.
3.	Facilitator of CSR/CDO	High	<ul style="list-style-type: none"> - Giving financial support in the form of capital aid and facilities - Holding facilitation and training to improve women's competency - Giving moral support - Improving company reputation through empowerment program 	High	Affecting group development through providing fund from corporation's CSR.
4.	Members of female farmer group	High	Implementing the livestock development activities, getting training, capital and facility aids.	Low	Affecting the participation in livestock breeding development activities.
5.	Village officials	Low	Just supervising the activities and low financial support due to limitation.	Low	Low effect because they only act to know and supervise the process of activity.
6.	Office of Agricultural affairs	Low	Supporting and supervising, coordinating with agricultural extensionists doing their task in the field.	High	Affecting the performance of female farmer group with the policies made.

Source: Result of in-depth interview and observation (2024)



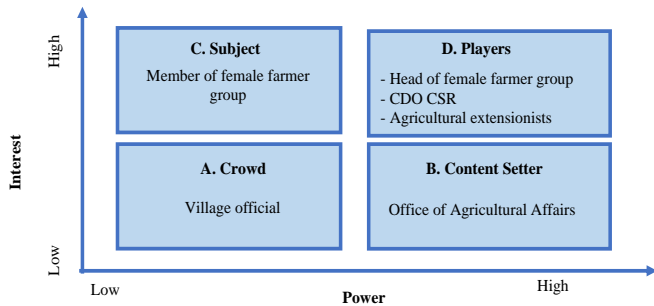


Figure 7. Matrix of stakeholder in female farmer empowerment in Sendangasri Village.

From Figure 7, the stakeholder in Sector A (Crowd), village official, has low interest and low power. It is because the communal goat breeding business development program through women empowerment is carried out through facilitation from the corporation's CSR program so that village stakeholder acts only as the supervisor of activities. Stakeholder in sector B (Content Setter), Office of Agricultural Affairs, has low interest and high power. The Office of Agricultural Affairs as the one with power (authority) of making policy in agricultural and livestock breeding sectors only gives permits and support the activities in its engagement in CSR program. Stakeholder in C sector (Subject), members of female farmer group, has high interest and low power. The members of female farmer group are the target of empowerment program needing financial and non-financial support to improve their wellbeing. Stakeholder in sector D (Players) includes head of female farmer group, agricultural extensionist, and CDO CSR with high interest and power. The head of female farmer group as a leader of her members serve to organize and to connect group to group facilitator. The leader should be able to deal with constraint and to bring change to the group and its member (Warrick, 2023) by means of preparing the vision of change and motivating the members to implement it (Hornstein, 2015). Servant leadership can encourage the members to engage in the work and strengthening their emotional relation to the group (Rahman *et al.*, 2024). Agricultural extensionists and CDO CSR serve as facilitator empowering the women in developing livestock breeding business with communal enclosure. Head of female farmer groups, agricultural extensionists, and CDO CSR belong to an agent of change engaging in leading the change from planning, implementation, to monitoring and evaluation. The agent of change's contribution to adopting technology innovation is carried out through providing training, solving problem, and giving full support to the target group (Rigby *et al.*, 2023). Mapping by identifying all parties involved in empowering women farmers in livestock management becomes one of the strategies to strengthen the role of stakeholders. Mapping helps in taking actions to align the interests of all stakeholders.

Additionally, by encouraging the involvement of all stakeholders, both primary and supporting, in every activity from planning, implementation, monitoring to evaluation. The implementation of regular meetings or discussion forums among stakeholders can encourage the exchange of ideas and inputs in goat farming development with women's empowerment. Effective communication among stakeholders must be established to enhance trust and openness among individuals in relation to the women's empowerment program. Well-established relationships among stakeholders can facilitate coordination and collaboration, making it easier to achieve common goals and minimize conflicts among individuals. Evaluation is conducted periodically to assess the extent to which the women's empowerment program is progressing and to encourage joint improvements.

The findings of this research indicate that empowerment can contribute positively to women both economically and socially. The often-overlooked role of women is enhanced through livestock management activities with a communal enclosure system. This research complements previous studies that focused on various interventions for women by providing access to resources (Njiru *et al.*, 2024), infrastructure, education, extension services (Elias *et al.*, 2024), improved financial access (Kumar *et al.*, 2024); technology training (Nirmala *et al.*, 2012) that supports livestock management thereby increasing women's involvement (Montcho *et al.*, 2023); women's economic autonomy (Fernandez-Gimenez *et al.*, 2021); household income and food security (Bain *et al.*, 2018). The findings in this study complement previous research by placing greater emphasis on social factors in women's empowerment. The success of livestock development through empowerment is not only influenced by the application of technological innovations but also by a management system with strong social capital values that bind everyone, making it an important aspect. This social capital is strengthened by increasing the involvement of all stakeholders by building trust among individuals, fostering synergistic relationships, reinforcing values, and social networks, thereby positively impacting community development. Social capital is very important for equitable development, promoting inclusion, financial resilience, and encouraging sustainable growth and economic justice (Huang *et al.*, 2024).

Conclusion: The development of livestock breeding sector through engaging the female farmer's role is implemented using CSR program. Goat is one of the ruminants bred widely by the people in Sendangasri Village. Innovation is introduced through livestock management in one same site, communal enclosure, from livestock breeding, care, and maintenance. Training and facilitation are implemented to improve women's competency in addition to managing enclosure, taking care of livestock and processing livestock waste into fertilizer. The livestock waste is processed into



solid and liquid manure. This fertilizer product is then used as the nutrition of plant in personnel and group lands. The fertilizer is also marketed through direct and online marketing. The livestock management system in the female farmer group has baby goat redeeming system containing strong social capital values among the members of group. The livestock development program also pays attention to drought issues in the presence of an activity of exchanging animal waste for water. The successful livestock development program through women empowerment needs all stakeholders' roles. Each of the stakeholders has their own power and interest and thereby, mapping will facilitate the development of strategy in achieving a successful objective. The establishment of synergic collaboration between stakeholders should be maintained and improved to achieve the empowerment of female farmers. Efforts to support the success of women's empowerment and sustainable goat farming practices, this research provides several policy recommendations, including: a) enhancing training activities to develop women's competencies in various fields to encourage economic opportunities for women; b) supporting the existence of women's groups as a platform for developing women's potential; c) increasing women's representation through forums that involve and provide opportunities for women to voice their ideas; d) improving support for facilities and infrastructure to support the livestock sector; and e) promoting innovation in implementing environmentally friendly practices in the livestock sector. This research has limitations as it only analyzes the short-term impact of women's empowerment through livestock management in a still limited area. Some recommendations for future research include a) conducting longitudinal studies to assess the long-term impact of women's empowerment programs through the integration of an integrated farming system on household income, food security, community development, and village development; b) exploring the potential to enhance the application of communal enclosure models and the success of interventions in communities in other regions.

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SDGs addressed: Gender equality, Zero Hunger, Gender Equality, Clean Water and Sanitation, Decent Work and Economic Growth, Partnerships for the Goals.

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